

## **REMARKS**

### **Status of the Claims**

Claims 1-9 and 12-19 are pending in this application.

Claims 1-9 and 12-19 are rejected.

Claims 10 and 11 have been canceled, without prejudice.

Claims 13 and 14 have been amended. Support for these amendments can be found throughout the specification, claims, and drawings, as originally filed.

### **Claim Objections**

Claim 13 has been objected to because of an informality. The Examiner stated that claim recites that claim 13 is dependent upon claim 10. The dependency of claim 13 on claim 10 is incorrect because claim 10 has been cancelled. Claim 13 has been amended to be dependent upon claim 12. Applicant believes that this objection has been overcome, and that no new matter has been added.

Claim 14 has also been objected to because of an informality. The Examiner stated that claim 14 is dependent upon claim 11, which has also been cancelled. Claim 14 has been amended to be dependent upon claim 13. Applicant believes that this objection has been overcome, and that no new matter has been added.

### **Rejection of Claims 1-4, 9, 12, and 15-19 Under 35 U.S.C. § 102(b)**

Claims 1-4, 9, 12, and 15-19 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Publication No. 2002/0032510 to Turnbull (hereafter "Turnbull '510").

The Applicant respectfully traverses the 35 U.S.C. § 102(b) rejection of claims 1-4, 9, 12, and 15-19. Claims 10 and 11 have been canceled, without prejudice. Therefore, the Applicant's remarks will be directed to remaining claims 1-4, 9, 12, and 15-19.

The law is clear that anticipation requires that a single prior art reference disclose each and every limitation of the claim sought to be rejected. The law is also clear that a claim in dependent form shall be construed to incorporate all the limitations of the claim to which it refers. Applicant argues that Turnbull '510 fails to disclose all of the elements of the rejected claims because Turnbull '510 does not disclose a bass reflex system as set forth in rejected claim 1, from which claims 2-4, 9, 12 and 15-19 depend. More specifically, Turnbull '510 does not mention a bass reflex system, but rather the specification of Turnbull '510 discloses the acoustic port 506 functioning similar to a speaker, and the drawings of Turnbull '510 do not suggest a bass reflex system.

Claim 1 includes the elements of a mirror housing in which at least one speaker is arranged, said speaker being part of a bass reflex system. These elements are not disclosed in Turnbull '510, which does not disclose a bass reflex system. Turnbull '510 discloses that the rearview mirror housing 502 includes an acoustic port 506 disposed at an opposite end from speaker 500. *Paragraph 222*. There is nothing in the disclosure of Turnbull '510 that discloses a bass reflex system. Turnbull '510 discloses an acoustic port, not a bass reflex system. For this reason alone the rejection should be removed.

Turnbull '510 does not specifically say what the acoustic port 506 is used for. However, Applicant further maintains that the acoustic port of Turnbull '510 is more akin to a second speaker than a bass reflex system. Turnbull '510 discloses an alternative embodiment using a second speaker in place of the acoustic port 506. *Paragraph 223*.

Clearly Turnbull '510 does not disclose a bass reflex system, but instead is disclosing something that is basically a second speaker. Therefore, claim 1 of the present application is not anticipated.

The speakers as disclosed in Turnbull '510 are not part of a bass reflex system. A bass reflex system incorporates the use of a port or vent, generally backed with a pipe or duct of circular or rectangular cross-section, which uses the sound from the rear side of the diaphragm of a speaker to increase the efficiency of the system at low frequencies as compared to a typical closed box loud speaker. See *the attached excerpt from [http://en.wikipedia.org/wiki/Bass\\_reflex](http://en.wikipedia.org/wiki/Bass_reflex)*. Turnbull '510 specifically states that the acoustic port 506 is used for directing sound toward a windshield and away from a microphone, and that the speakers in the alternate embodiment are preferably driven out of phase with each other to create a null around the microphone such that the sound from the speaker is not fed into the microphone. Furthermore, the acoustic port 506 shown in Fig. 17 of Turnbull '510 is positioned at an opposite end of the housing 501, away from the speaker 500 which is where the diaphragm is located. Thus, the acoustic port 506 would not function as a bass reflex system since it is not operably linked to the diaphragm. Therefore, Turnbull '510 does not disclose a mirror housing in which at least one speaker is arranged, said speaker being part of a bass reflex system, as set forth in claim 1 of the present invention.

In view of the foregoing, the Applicant respectfully submits that claim 1 defines over the art cited by the Examiner and respectfully requests withdrawal of the rejection. Likewise, claims 2-4, 9, 12, and 15-19, which depend from claim 1, further define the invention and define over the art cited by the Examiner. Thus, Applicant respectfully requests withdrawal of the rejection.

### **Rejection of Claims 5-8 and 13-14 Under 35 U.S.C. § 103**

Claims 5-8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Turnbull '510 in view of U.S. Patent No. 6,127,919 to Wylin (hereafter "Wylin '919").

The Applicant respectfully traverses the 35 U.S.C. § 103(a) rejection of claims 5-8 and 13-14. Claims 10-11 have been canceled, without prejudice. Therefore, the Applicant's remarks will be directed to remaining claims 5-8 and 13-14.

Establishing a prima facie case of obviousness requires that the proposed combination of references teach or render obvious **all** the elements of the rejected claims. Applicant argues that Turnbull '510 in view of Wylin '919 fails to teach or render obvious all of the elements of the rejected claims because Turnbull '510 in view of Wylin '919 does not teach a bass reflex system, as set forth in rejected claim 1, from which claims 5-8 depend. More specifically, Turnbull '510 does not mention a bass reflex system, but rather the specification of Turnbull '510 teaches the acoustic port 506 functioning similar to a speaker, and the drawings of Turnbull '510 do not suggest a bass reflex system. Wylin '919 also does not mention a bass reflex system, but rather teaches a speaker device having first and second speakers.

Claim 1, from which rejected claims 5-8 either directly or indirectly depend, includes the elements of a mirror housing in which at least one speaker is arranged, said speaker being part of a bass reflex system. These elements are not taught by Turnbull '510 in view of Wylin '919, neither of which teach nor render obvious a bass reflex system. Turnbull '510 teaches a rearview mirror housing 502 that includes an acoustic port 506 disposed on an opposite end from speaker 500. *Paragraph 222*. The specification of Turnbull '510 teaches replacing the acoustic port 506 with a second speaker. *Paragraph 223*. Thus, the specification of Turnbull '510 suggests that the function of the acoustic port is equivalent to a second speaker. There is nothing in

Turnbull '506 that mentions a bass reflex system, much less the acoustic port '506 being used in a bass reflex system. Clearly Turnbull '510 does not teach or render obvious a bass reflex system, but instead is disclosing something that is a second speaker.

Wylin '919 teaches or renders obvious a speaker device 10 is shown in FIGS. 1, 2, and 3 to include a rigid body portion 30, an articulated arm 32, a full-size mirror 34 and first and second audio speakers 36 and 38, respectively. *Col. 2, lines 48-51*. Wylin '919 also teaches or suggests that sound waves 120 emanating from first and second audio speakers 36 and 38 reflect off windshield 90 and back toward the vehicle occupants. *Col. 3, lines 52-55*. Wylin '919 also teaches or suggests that as sound waves 120 emit back from windshield 90, they will be approximately positioned at the ear-level of the vehicle occupants. *Col. 3, lines 55-57*.

Turnbull '510 in view of Wylin '919 cannot be combined to render the present invention obvious. The speakers as taught by Turnbull '510 and Wylin '919 are not part of a bass reflex system. A bass reflex system incorporates the use of a port or vent, generally backed with a pipe or duct of circular or rectangular cross-section, which used the sound from the rear side of the diaphragm of a speaker to increase the efficiency of the system at low frequencies as compared to a typical closed box loud speaker. See *the attached excerpt from [http://en.wikipedia.org/wiki/Bass\\_reflex](http://en.wikipedia.org/wiki/Bass_reflex)*. Turnbull '510 specifically states that the acoustic port 506 is used for directing sound toward a windshield and away from a microphone, and that the speakers in the alternate embodiment are preferably driven out of phase with each other to create a null around the microphone such that the sound from the speaker is not fed into the microphone. Furthermore, the acoustic port 506 shown in Fig. 17 of Turnbull '510 is positioned at an opposite end of the housing 501, away from the speaker 500 which is where the

diaphragm is located. Thus, the acoustic port 506 would not function as a bass reflex system since it is not operably linked to the diaphragm. Additionally, the disclosure and Figures of Wylin '919 only teach the use of two speakers. Wylin '919 also teaches a first and second audio speaker mounted in a mirror housing which projects sounds which emanates through the speakers and reflects off the windshield. Therefore, Turnbull '510 in view of Wylin '919 does not teach or render obvious a mirror housing in which at least one speaker is arranged, said speaker being part of a bass reflex system, as set forth in claim 1 of the present invention. Withdrawal of this rejection is respectfully requested.

Claims 13-14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable Turnbull '510 in view of U.S. Patent No. 4,871,953 to Anstee (hereafter "Anstee '953").

Claims 13-14 are dependent claims which are either directly or indirectly dependent upon claim 1. As previously mentioned, claim 1 includes the elements of a mirror housing in which at least one speaker is arranged, said speaker being part of a bass reflex system. As shown above, Turnbull '510 does not teach or render obvious these elements. Therefore, Anstee '953 must make up for the deficiencies of Turnbull '510, or the rejection will fall.

Anstee '953 teaches or renders obvious a housing 10 of the left-hand door mirror encloses two electric motors 12 and 14 arranged to vary the orientation of the reflected member (not shown) about horizontal and vertical axis, respectively. *Col. 1, lines 62-66*. Each of the motors 12 and 14 is also coupled to drive a respective potentiometer 16, 18 which is arranged to provide an analogue voltage indicating the orientation of the reflective member about the corresponding axis. *Col. 1, line 66 - Col. 2, line 2*. The mirror as taught by Anstee '953 has two potentiometers which are used for the orientation of a reflective member in a mirror housing. There is no mention in Anstee

'953 of speakers at all, let alone speakers being used in the mirror housing that are part of a bass reflex system. Therefore, Turnbull '510 in view of Anstee '953 cannot be combined to arrive at the invention of a mirror housing in which at least one speaker is arranged, said speaker being part of a bass reflex system, as set forth in claim 1 of the present invention.

In view of the foregoing, the Applicant respectfully submits that claim 1 defines over the art cited by the Examiner and respectfully requests withdrawal of the rejection. Likewise, claims 5-8 and 13-14, which depend from claim 1, further define the invention and define over the art cited by the Examiner. Thus, Applicant respectfully requests withdrawal of the rejection.

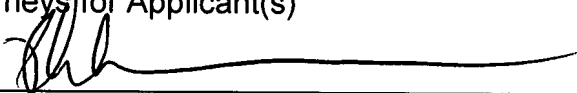
### **CONCLUSION**

It is respectfully submitted that in view of the above amendments and remarks the claims 1-19 are patentably distinguishable because the cited patents, whether taken alone or in combination, anticipate or render obvious, the present invention. Therefore, Applicant submits that the pending claims are properly allowable, which allowance is respectfully requested.

The Examiner is invited to telephone the Applicant's undersigned attorney at (248) 364-4300 if any unresolved matters remain.

Respectfully submitted,

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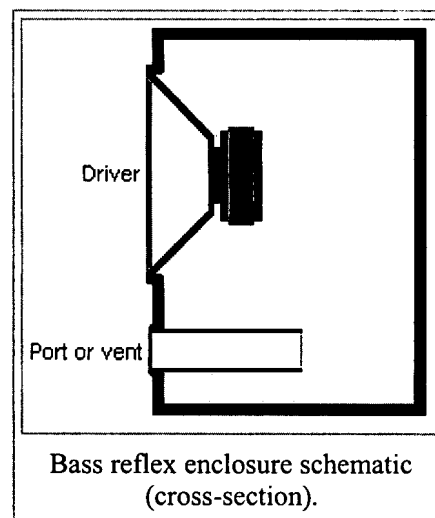
# Bass reflex

From Wikipedia, the free encyclopedia

A **Bass reflex** system (also known as a **ported**, **vented box** or **reflex port**) is a type of loudspeaker enclosure that uses the sound from the rear side of the diaphragm to increase the efficiency of the system at low frequencies as compared to a typical closed box loudspeaker or an infinite baffle mounting.

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## Explanation

In contrast to closed box loudspeakers, which are substantially air tight, a bass reflex system has an opening called a *port* or *vent* which consists of an opening, generally backed with a pipe or duct of circular or rectangular cross section. The air mass in this opening resonates with the "springyness" of the air inside the enclosure in exactly the same fashion as the air in a bottle resonates when a current of air is directed across the opening. The frequency at which the box/port system resonates, known as the Helmholtz resonance, is determined by the cross sectional area and length of the duct and the volume of air inside the enclosure.

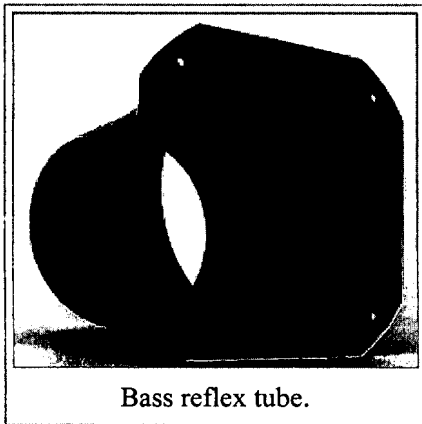
When all features are compared, for home use the advantages tend to outweigh the disadvantages because they allow more bass extension out of a smaller box. The design is so popular among consumers and manufacturers but the increase in bass output is invariably achieved at the expense of temporal integrity of the signal and the buildup of more resonances. Reflex designs can be undesirable in settings where the utmost accuracy of reproduction is desired, e.g. in monitoring facilities, recording studios etc.

## History

The effect of the various speaker parameters, enclosure sizes and port (and duct) dimensions on the performance of bass reflex systems was not well understood until the early 1970s. At that time, pioneering analyses by A.N. Thiele<sup>[1]</sup> and Richard H. Small<sup>[2]</sup> related these factors to a series of "alignments" (sets of the relevant speaker parameters) that produced useful, predictable responses. These made it possible for speaker manufacturers to design speakers to match various sizes of enclosures and enclosures to match given speakers with great predictability. All of this is constrained by the laws of physics, which is discussed in detail in Thiele and Small's work. It is not possible to have a small speaker in a small enclosure producing extended bass response at high efficiencies (ie, requiring only a



low-powered amplifier). It's possible to have two of these parameters, but not all. The sound pressure produced is dependent on the efficiency of the speaker, the mechanical or thermal power handling of the driver, the power input and the size of the driver.



Bass reflex tube.

## Advantages

This resonant system augments the bass response of the driver, and if designed properly, can extend the frequency response of the driver/enclosure combination to below the range the driver could reproduce in a sealed box. The enclosure resonance has a secondary benefit in that it limits cone movement in a band of frequencies centered around the tuning frequency, reducing distortion in that frequency range.

## Limitations

The tradeoff for this augmentation is that at frequencies below 'tuning', the port unloads the cone and allows it to move much as if the speaker were not in an enclosure at all. This means the speaker can be driven past safe limits at frequencies below the tuning frequency with much less power than in an equivalently sized sealed enclosure. For this reason, high powered systems using a bass reflex design are often protected by a filter that removes signals below a certain frequency. One such filter is the rumble filter often built in to receivers or amplifiers designed to be used with LP records because of the undesired LF rumble from the mechanical parts of the turntable. Because of the complex frequency dependent loading, ported enclosures generally result in poorer transient response at low frequencies than in well-designed sealed box systems. The audible effects of this in a properly designed system are debatable. A poorly designed bass reflex system, generally one that is tuned too high, can ring at the tuning frequency and create a 'booming' one-note quality to the bass frequencies.

Ported systems are more complex than sealed box systems, and are more expensive, all other factors being equal.

## See also

loudspeaker enclosure

## References

- <sup>^</sup> Thiele, A. N., "Loudspeakers in Vented Boxes: Parts I and II," J. Audio Engineering Soc., Vol 19, No. 5, May 1971, pp 382-392 (Reprinted from a 1961 publication in Proc. IRE Australia).
- <sup>^</sup> Small, Richard H., "Vented-Box Loudspeaker Systems, Part I: Small-Signal Analysis", J. Audio Engineering Soc., Vol 21, No. 5, June 1973, pp 363-444.

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Category: Speakers

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